

## PATENT COOPERATION TREATY

## PCT

REC'D 29 MAY 2006

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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PA136826/PCT	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. PCT/IB2005/000542	International filing date (day/month/year) 03.03.2005	Priority date (day/month/year) 04.03.2004	
International Patent Classification (IPC) or national classification and IPC INV. A61B6/00 A61B6/06			
Applicant LODOX SYSTEMS (PROPRIETARY) LIMITED et al.			

<ol style="list-style-type: none"> <li>This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</li> <li>This REPORT consists of a total of 8 sheets, including this cover sheet.</li> <li>This report is also accompanied by ANNEXES, comprising:           <ol style="list-style-type: none"> <li><input type="checkbox"/> <i>sent to the applicant and to the International Bureau</i> a total of sheets, as follows:               <ul style="list-style-type: none"> <li><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</li> <li><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</li> </ul> </li> <li><input type="checkbox"/> <i>(sent to the International Bureau only)</i> a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</li> </ol> </li> </ol>
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<ol style="list-style-type: none"> <li>This report contains indications relating to the following items:           <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Box No. I Basis of the report</li> <li><input type="checkbox"/> Box No. II Priority</li> <li><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li><input checked="" type="checkbox"/> Box No. IV Lack of unity of invention</li> <li><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li><input type="checkbox"/> Box No. VI Certain documents cited</li> <li><input type="checkbox"/> Box No. VII Certain defects in the international application</li> <li><input type="checkbox"/> Box No. VIII Certain observations on the international application</li> </ul> </li> </ol>
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Date of submission of the demand 22.12.2005	Date of completion of this report 26.05.2006
Name and mailing address of the international preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized officer Pohjamo, T Telephone No. +31 70 340-



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**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3 and 23.1(b))
    - publication of the international application (under Rule 12.4)
    - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

**Description, Pages**

1-16 as originally filed

**Claims, Numbers**

1-16 as originally filed

**Drawings, Sheets**

1/5-5/5 as originally filed

a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3.  The amendments have resulted in the cancellation of:
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):
4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. IV Lack of unity of invention**

1.  In response to the invitation to restrict or pay additional fees, the applicant has:
  - restricted the claims.
  - paid additional fees.
  - paid additional fees under protest.
  - neither restricted nor paid additional fees.
2.  This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is:
  - complied with.
  - not complied with for the following reasons:  
**see separate sheet**
4. Consequently, this report has been established in respect of the following parts of the international application:
  - all parts.
  - the parts relating to claims Nos. .

**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	3, 4, 6-10, 11-16
	No: Claims	1, 2, 5
Inventive step (IS)	Yes: Claims	3, 4, 6-10, 11-16
	No: Claims	1, 2, 5
Industrial applicability (IA)	Yes: Claims	1-16
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

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**Re Item IV.**

- 1 Reference is made to the following documents:  
D1 : WO 03/055393 A (UNIVERSITY OF MASSACHUSETTS MEDICAL CENTER;  
KARELLAS, ANDREW; SURYANAR) 10 July 2003 (2003-07-10)  
D2 : US 2002/196899 A1 (KARELLAS ANDREW) 26 December 2002 (2002-12-26)  
D3: US 2001/005409 A1 (GOHNO MAKOTO ET AL) 28 June 2001 (2001-06-28)
- 2 This Authority considers that there are 2 inventions covered by the claims indicated as follows:
  - I: Claims 1-10 directed to an imaging apparatus and to a method of operating it
  - II: Claims 11-16 directed to a collimator

The reasons for which the inventions are not so linked as to form a single general inventive concept, as required by Rule 13.1 PCT, are as follows:

  - 3 The prior art has been identified as document D1 and discloses an imaging device according claim 1 (see detailed objection below under Item V).

It follows that the following technical features of claims 3-10, and 11-16 make a contribution over the prior art and can be considered as special technical features within the meaning of Rule 13.2 PCT:

  - I: combining pixels according to collimator setting
  - II: shutter elements, drive, guide mechanism of the collimator
  - 4 The problem solved by these special technical features can therefore be construed as:
    - I: how to enhance contrast resolution of the image
    - II: how to control the collimator opening
  - 5 In conclusion, the groups of claims are not linked by common or corresponding

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special technical features and define 2 different inventions not linked by a single general inventive concept.

The application, hence does not meet the requirements of unity of invention as defined in Rules 13.1 and 13.2 PCT.

**Re Item V.**

**1 INDEPENDENT CLAIM 1**

1.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

Document D1 discloses (the references in parentheses applying to this document):

An imaging apparatus comprising: a radiation source (12) for generating an imaging beam; a detector (26) responsive to the imaging beam to generate image signals and comprising an array of pixels (p. 3 lines 14-20) arranged in rows and columns, each pixel being responsive to incident radiation to generate an output signal; a drive (implicit from p. 8 lines 11-21) arranged to move the radiation source and the detector relative to a subject in a scanning direction; an adjustable collimator (p. 5 lines 28-30) arranged to vary the width of the imaging beam in the scanning direction; and a control system (25) responsive to adjustment of the collimator to combine output signals of groups of two or more pixels in the detector, thereby to optimize a selected characteristic of the image signal (p. 4 lines 1-8; p. 8 lines 4-11).

**2 DEPENDENT CLAIMS 2, 5**

Dependent claims 2 and 5 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT).

**3 DEPENDENT CLAIMS 3, 4**

The combination of the features of dependent claims 3 and 4 are neither known from, nor rendered obvious by, the available prior art. The reasons are as follows:

Defining a super pixel comprising an array of fundamental pixels according to the collimator setting (claim 3) is not known from the cited documents, and would

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therefore not be obvious for a skilled person. The same applies to claim 4, as it is dependent on claim 3.

**4 INDEPENDENT CLAIM 6**

4.1 Document D2, which is considered to represent the most relevant state of the art, discloses (the references in parentheses applying to this document):

A method of operating imaging apparatus of the kind having a radiation source and an associated detector which are moveable relative to a subject, the method comprising: generating an imaging beam (p. 8 lines 8, 9, 22-24) from the radiation source; moving the radiation source and the detector relative to a subject in a scanning direction (implicit from p. 8 lines 11-21) to generate output signals from each of a plurality of pixels of the detector; adjusting a collimator (p. 8 lines 19-21) to vary the width of the imaging beam in the scanning direction

From this, the subject-matter of independent claim 6 differs in that the method further discloses:

detecting the setting of the collimator; and combining the output signals of groups of two or more pixels according to the setting of the collimator, thereby to optimize a selected characteristic of the image signals.

4.1.1 The subject-matter of claim 6 is therefore novel (Article 33(2) PCT)  
The problem to be solved by the present invention may be regarded as:  
"how to optimize the choice of contrast resolution"

4.1.2 The solution to this problem proposed in claim 6 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

None of the cited documents disclose a method for choosing contrast resolution, where after determining the collimator setting, a proper pixel binning

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method would be chosen, in order to achieve a wanted contrast resolution.

4.1.3 Claims 7-10 are dependent on claim 6 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

**5 INDEPENDENT CLAIM 11**

5.1 Document D3, which is considered to represent the most relevant state of the art, discloses (the references in parentheses applying to this document):

A collimator (6) for adjusting the effective width of an imaging beam generated by a radiation source, the collimator comprising: first and second shutter elements (60, 61) arranged side by side to define a slit through which radiation emitted by the source can pass; a drive (7a) arranged to move the shutter elements in a direction parallel to the slit; and a guide mechanism (63, 64).

From this, the subject-matter of independent claim 6 differs in that the method further discloses:

The guide mechanism comprising first and second tapered surfaces arranged to cooperate with respective tapered surfaces on the first and second shutter elements, so that operation of the drive varies the width of the slit.

5.1.1 The subject-matter of claim 11 is therefore novel (Article 33(2) PCT)  
The problem to be solved by the present invention may be regarded as:  
"how to construct a slit width adjustment system ensuring parallel slit and a constant center line, where the system is easy to manufacture"

5.1.2 The solution to this problem proposed in claim 11 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

None of the cited documents disclose a slit width adjusting system where the slit

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width is regulated by tapered elements.

5.1.3 Claims 12-16 are dependent on claim 11 and as such also meet the requirements of the PCT with respect to novelty and inventive step.